MUX-9258-A

AES/EBU Multiplexer

User Manual

ROSS

Video Production Technology

MUX-9258-A User Manual

- Ross Part Number: **9258ADR-004-01**
- Release Date: June 24, 2013.

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Important Regulatory and Safety Notices to Service Personnel

Before using this product and any associated equipment, refer to the "**Important Safety Instructions**" listed below to avoid personnel injury and to prevent product damage.

Product may require specific equipment, and/or installation procedures to be carried out to satisfy certain regulatory compliance requirements. Notices have been included in this publication to call attention to these specific requirements.

Symbol Meanings

Protective Earth — *This symbol identifies a Protective Earth (PE) terminal, which is provided for connection of the supply system's protective earth (green or green/yellow) conductor.*

This symbol on the equipment refers you to important operating and maintenance (servicing) instructions within the Product Manual Documentation. Failure to heed this information may present a major risk of damage or injury to persons or equipment.

Warning — *The symbol with the word "**Warning**" within the equipment manual indicates a potentially hazardous situation which, if not avoided, could result in death or serious injury.*

Caution — *The symbol with the word "**Caution**" within the equipment manual indicates a potentially hazardous situation which, if not avoided, may result in minor or moderate injury. It may also be used to alert against unsafe practices.*

Warning Hazardous Voltages — *This symbol is intended to alert the user to the presence of uninsulated "dangerous voltage" within the product enclosure that may be of sufficient magnitude to constitute a risk of shock to persons.*

ESD Susceptibility — *This symbol is used to alert the user that an electrical or electronic device or assembly is susceptible to damage from an ESD event.*

Important Safety Instructions

1. **Warning** – Read these instructions.
2. Follow all instructions.
3. Refer all servicing to qualified personnel.
4. The safe operation of this product requires that a protective earth connection be provided. A grounding conductor in the equipment's supply cord provides this protective earth. To reduce the risk of electrical shock to the operator and service personnel, this ground conductor must be connected to an earthed ground.
5. The AC appliance inlet on the product's power supply is the means to disconnect the supply from the AC Mains. It must remain readily operable for this purpose.
6. **Warning – Indoor Use: WARNING:** To reduce the risk of fire or electric shock, do not expose this apparatus to rain or moisture.

EMC Notices

United States of America
FCC Part 15

This equipment has been tested and found to comply with the limits for a class A Digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

Notice — *Changes or modifications to this equipment not expressly approved by Ross Video Limited could void the user's authority to operate this equipment.*

CANADA

This Class "A" digital apparatus complies with Canadian ICES-003.

Cet appariel numerique de la classe "A" est conforme a la norme NMB-003 du Canada.

EUROPE

This equipment is in compliance with the essential requirements and other relevant provisions of **CE Directive 93/68/EEC**.

INTERNATIONAL

This equipment has been tested to **CISPR 22:2009** and found to comply with the limits for a Class A Digital device.

AUSTRALIA

This equipment has been tested to **AS/NZS CISPR 22:2009**, and found to comply with the limits for a Class A Digital device.

Maintenance/User Serviceable Parts

Routine maintenance to this GearLite product is not required. This product contains no user serviceable parts. If the module does not appear to be working properly, please contact Technical Support using the numbers listed under the "Contact Us" section on the last page of this manual. All GearLite products are covered by a generous 3-year warranty and will be repaired without charge for materials or labor within this period. See the "Warranty and Repair Policy" section in this manual for details.

Environmental Information

The equipment that you purchased required the extraction and use of natural resources for its production. It may contain hazardous substances that could impact health and the environment.

To avoid the potential release of those substances into the environment and to diminish the need for the extraction of natural resources, Ross Video encourages you to use the appropriate take-back systems. These systems will reuse or recycle most of the materials from your end-of-life equipment in an environmentally friendly and health conscious manner.

The crossed-out wheeled bin symbol invites you to use these systems.

If you need more information on the collection, reuse, and recycling systems, please contact your local or regional waste administration.

You can also contact Ross Video for more information on the environmental performances of our products.

Introduction

Overview

The MUX-9258-A provides a cost effective miniature solution to multiplex four AES/EBU digital audio signals into a 3G/HD/SD-SDI signal.

The MUX-9258-A accepts one SDI signal and provides one processed SDI output on BNC connectors. The four DIP switch assignable AES/EBU inputs are also provided on BNC connectors.

Five dual color LED indicators provide SDI and AES/EBU signal status information. The SDI LED will be illuminated green when a valid SDI signal is present at the input or illuminated red when no SDI signal is present. The A1, A2, A3, A4 LED's will be illuminated green when an AES signal is present on inputs 1 through 4 respectively and available to be multiplexed into the SDI signal. These LED's will remain off if no signal is present on the respective inputs.

Power to the MUX-9258-A is provided by an external AC adapter with locking DC connector supplied with the module.

Simplified Block Diagram

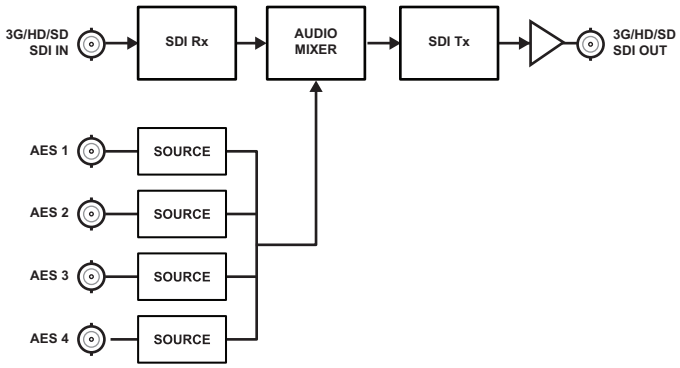

Figure 1 *Simplified Block Diagram of MUX-9258-A Functions*

Features

The MUX-9258-A includes the following features:

- Four BNC connectors for the AES inputs
- One BNC connector for the SDI input
- One BNC connector for the SDI output
- Supports SDI Data Rates of 270Mbps, 1.485Gbps, 2.97Gbps
- Supports AES3-id

- Small brick form factor
- 5V universal adapter with locking DC connector
- 3-year warranty

Installation

Static Discharge

Whenever handling the MUX-9258-A and other related equipment, please observe all static discharge precautions as described in the following note:

ESD Susceptibility — *Static discharge can cause serious damage to sensitive semiconductor devices. Avoid handling circuit boards in high static environments, such as carpeted areas, and when wearing synthetic fiber clothing. Always exercise proper grounding precautions when working on circuit boards and related equipment.*

Unpacking

Unpack each MUX-9258-A you received from the shipping container and ensure that all items are included. If any items are missing or damaged, contact your sales representative or Ross Video directly.

Mounting and Installation

The MUX-9258-A can be mounted in any convenient location. However, to ensure long life for this product, observe the following precautions and operating requirements:

- Maintain an ambient temperature of 0°C to 40°C (32°F to 104°F).
- Allow for air circulation around the chassis for convectional cooling.

Many different mounting positions are possible with the included mounting hardware. Some installation options are permanent and require careful consideration of the final positioning before installation. Please note that in some mounting locations, the power adaptor must be affixed in a similar manner as the chassis.

Other possible options include the use of adhesive magnetic sheets (not included) affixed to the chassis and the power adaptor, for removable mounting on metal cabinets etc.

Surface Mount Strips

The included VELCRO® brand surface mount strips allow the GearLite module and power supply to be affixed to a permanent location during use and easily removed for adjustments. Carefully consider the installation location before

proceeding; the adhesive is very aggressive and is not easily removed. The adhesive will cure fully in 24 hours.

To install the Surface Mount Strips

1. Remove the **Protective Backing Film** from the adhesive on the bottom of the two VELCRO® brand **Surface Mount Strips**.
2. Adhere the **Surface Mount Strips** to the bottom side of the chassis. (**Figure 2**)

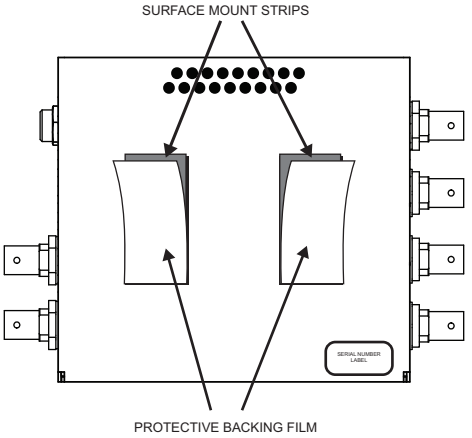

Figure 2 *Surface Mount Installation Option*

3. Remove the **Protective Backing Film** from the other side of the VELCRO® brand **Surface Mount Strips**.
4. Press the chassis into position on the surface you want to mount it to.

Operating Tip — *An additional VELCRO® brand **Surface Mount Strip** is available to mount the power adapter.*

Non-Slip Pads

Four non-slip adhesive pads have been supplied for desktop placements. Simply remove the protective backing film from the adhesive and affix one non-slip pad to each of the four corners on the bottom of the chassis.

Setup and Operation

Power Adapter and Supply

Connect the PS-9000 power adaptor to the power supply connector. The PS-9000 provides regulated +5V DC (5%) @ up to 2A. The DC power cord has a locking connector that securely fastens into the power supply DC jack on the MUX-9258-A. The MUX-9258-A has a standard miniature power jack (center pin positive). Refer to the section "**Important Regulatory and Safety Notices to Service Personnel**" at the front of this manual for details.

If using an adaptor other than the PS-9000, ensure that:

- the polarity is correct
- the voltage is +5V DC regulated to 5%
- sufficient current for the MUX-9258-A is supplied

Caution — *Use of improper adaptors may damage the MUX-9258-A and will void the warranty.*

Cable Connections Overview

There are four connections to the MUX-9258-A:

- Four BNC jacks for the AES inputs
- An BNC jack for the SDI input
- An BNC jack for the SDI output
- A power supply connection to the GearLite PS-9000 power adaptor

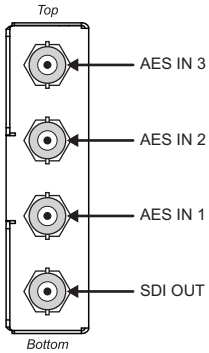

Figure 3 *AES 1-3 and SDI OUT Connections*

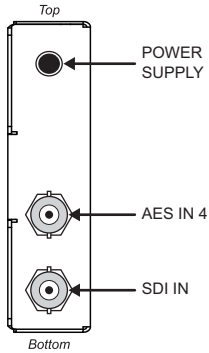

Figure 4 *Power, AES 4, and SDI IN Connections*

SDI Connections

Connect the SDI input cable to the SDI IN BNC.

Connect the SDI output cable to the SDI OUT BNC.

AES Connections

Connect the AES output cables for DMX1 to the AES 1 and AES 2 BNCs.

Connect the AES output cables for DMX2 to the AES 3 and AES 4 BNCs.

Status LEDs

The chassis faceplate of the MUX-9258-A includes five LEDs that report the SDI and signal status information and the presence of audio. Refer to **Figure 5** for the LED locations.

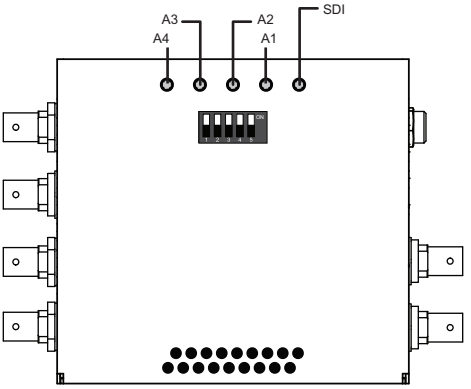

***Figure 5** MUX-9258-A Front Edge Status Indicator LED*

Table 1 describes the status LED available on the MUX-9258-A.

Table 1 Status LED Descriptions

LED	Color	Function
A4	Green	When lit green, this LED indicates an AES/EBU signal is present on AES input 4.
	Off	When unlit, this LED indicates no AES/EBU signal present on AES input 4.
A3	Green	When lit green, this LED indicates an AES/EBU signal is present on AES input 3.
	Off	When unlit, this LED indicates no AES/EBU signal present on AES input 3.

Table 1 Status LED Descriptions

LED	Color	Function
A2	Green	When lit green, this LED indicates an AES/EBU signal is present on AES input 2.
	Off	When unlit, this LED indicates no AES/EBU signal present on AES input 2.
A1	Green	When lit green, this LED indicates an AES/EBU signal is present on AES input 1.
	Off	When unlit, this LED indicates no AES/EBU signal present on AES input 1.
SDI	Green	When lit green, this LED indicates the MUX-9258-A is locked to a valid SDI signal.
	Red	When lit red, this LED indicates the MUX-9258-A is not locked to a valid SDI signal.

DIP Switch Configuration

The MUX-9258-A provides a block of five DIP switches located on the front panel. (**Figure 6**) These switches are used to configure the unit for various modes of operation.

The following conventions are used in this section:

↑ Set the DIP switch in the ON position

↓ Set the DIP Switch in the OFF position

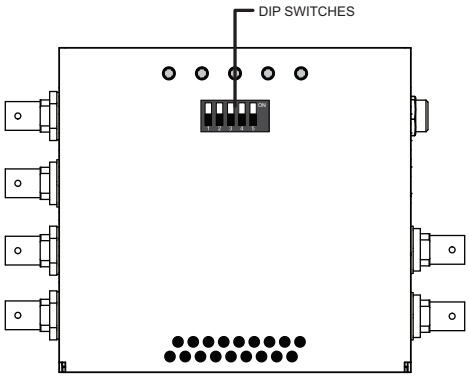

Figure 6 *DIP Switch Location on the MUX-9258-A*

SW1 to **SW5** are set in the ON (↑) position by default as illustrated in **Figure 7**. Note that settings marked with an asterisk (*) are the default settings.

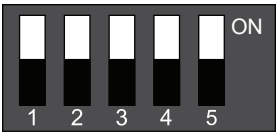

***Figure 7** DIP Switches — Set in the ON Position*

Audio Group Configuration

The MUX-9258-A can take in up to four AES inputs and embed them into the audio channels in an 3G/HD/SD-SDI output.

Use **SW4** and **SW5** in conjunction to assign the AES inputs to the audio groups. **Table 2** outlines how to set the DIP Switches.

Table 2 Audio Group Configuration

SW4	SW5	AES 1 and 2	AES 3 and 4
↓	↓	G1	G2
↓	↑	G2	G3
↑	↓	G3	G4
↑	↑	G4	G1

Sample Rate Conversion Setup

Table 3 SRC Setup

SW1	Description
↓*	The 48kHz SRC is enabled.
↑	Disables the SRC on all four AES/EBU inputs/ This allows for encoding of Dolby encoded signals.

Cascade Setup

Table 4 Cascade Setup

SW2	Description
↓*	The MUX-9258-A will strip all incoming audio from the signal before embedding the AES inputs.
↑	The MUX-9258-A will embed the AES inputs as well as passing any audio in other groups.

Disabling MUX Group 2

Table 5 MUX2 Setup

SW2	Description
↓*	Operates as a full two Group multiplexer
↑	Turns Group 2 multiplexer off to operate as a single group multiplexer.

Specifications

Specifications are subject to change without notification.

Table 6 MUX-9258-A — Technical Specifications

Category	Parameter	Specification
SDI Input and Output	Standards	SMPTE 259M, SMPTE 292M, SMPTE 424M
	Level	800mV p-p +/- 10%
	SDI Data Rates	270Mbps, 1.485Gbps, 2.97Gbps
	Impedance	75ohm
	Input Cable Equalization	>50m Belden 1694A cable to 2.97Gbps
	Return Loss	>10dB @ 2.97Gbps
AES/EBU Inputs	Standards	AES3-id
	Level	1V p-p nominal
	Sampling Frequency	32kHz to 96kHz when SRC is enabled
	Impedance	75ohm
Power	Required Voltage	+5v DC
	Power Consumption	>4W
Other	Dimensions	3.938” x 2.625” x 0.813” (10cm x 6.67cm x 2.07cm
	Weight	7.8oz (221g)

Service Information

Warranty and Repair Policy

The GearLite MUX-9258-A is warranted to be free of any defect with respect to performance, quality, reliability, and workmanship for a period of THREE (3) years from the date of delivery to the customer. In the event that your GearLite MUX-9258-A proves to be defective in any way during this warranty period, Ross Video Limited reserves the right to repair or replace this piece of equipment with a unit of equal or superior performance characteristics.

Should you find that this GearLite MUX-9258-A has failed after your warranty period has expired, we will repair your defective product should suitable replacement components be available. You, the owner, will bear any labor and/or part costs incurred in the repair or refurbishment of said equipment beyond the THREE (3) year warranty period.

In no event shall Ross Video Limited be liable for direct, indirect, special, incidental, or consequential damages (including loss of profits) incurred by the use of this product. Implied warranties are expressly limited to the duration of this warranty.

This GearLite MUX-9258-A User Manual provides all pertinent information for the safe installation and operation of your GearLite Product. Ross Video policy dictates that all repairs to the GearLite MUX-9258-A are to be conducted only by an authorized Ross Video Limited factory representative. Therefore, any unauthorized attempt to repair this product, by anyone other than an authorized Ross Video Limited factory representative, will automatically void the warranty. Please contact Ross Video Technical Support for more information.

In Case of Problems

Should any problem arise with your GearLite MUX-9258-A, please contact the Ross Video Technical Support Department. (Contact information is supplied at the end of this publication.)

A Return Material Authorization number (RMA) will be issued to you, as well as specific shipping instructions, should you wish our factory to repair your GearLite MUX-9258-A. If required, a temporary replacement module will be made available at a nominal charge. Any shipping costs incurred will be the responsibility of you, the customer. All products shipped to you from Ross Video Limited will be shipped collect.

The Ross Video Technical Support Department will continue to provide advice on any product manufactured by Ross Video Limited, beyond the warranty period without charge, for the life of the equipment.

Notes:

Notes:

Contact Us

Contact our friendly and professional support representatives for the following:

- Name and address of your local dealer
- Product information and pricing
- Technical support
- Upcoming trade show information

Technical Support	Telephone:	+1 613 • 652 • 4886
	After Hours Emergency:	+1 613 • 349 • 0006
	Email:	techsupport@rossvideo.com

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